# Unit Plan Template

Click on any descriptive text, then type your own.

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| **Unit Author** | | | | | | |
| First and Last Name | | | | | Dale Taylor | |
| School District | | | | | Rainier | |
| School Name | | | | | Rainier Jr/Sr High School | |
| School City, State | | | | | Rainier, OR | |
| **Unit Overview** | | | | | | |
| **Unit Title** | | | | | | |
| Energy for the Masses | | | | | | |
| **Unit Summary** | | | | | | |
| Students identify the components of photosynthesis and cellular respiration. They conduct an experiment varying one of the conditions of photosynthesis and measure its effect. The student then is to consider the effects of the buildup of greenhouse gases beyond the effect on climate change; "If the concentration of CO2 continues to increase, what would be the effect on plants and algae (photoautotrophs)? What might be the effect on humans and other heterotrophs?" | | | | | | |
| **Subject Area** | | | | | | |
| Life Sciences | | | | | | |
| **Grade Level** | | | | | | |
| 10th grade | | | | | | |
| **Approximate Time Needed** | | | | | | |
| 3 weeks | | | | | | |
| **Unit Foundation** | | | | | | |
| **Targeted Content Standards and Benchmarks** | | | | | | |
| H.2L.1 Explain how energy and chemical elements pass through systems. Describe how chemical elements are combined and recombined in different ways as they cycle through the various levels of organization in biological systems.  H.3S.2 Design and conduct a controlled experiment, field study, or other investigation to make systematic  observations about the natural world, including the collection of sufficient and appropriate data. | | | | | | |
| **Student Objectives/Learning Outcomes** | | | | | |
| Students will understand the process of photosynthesis.  Students will understand the process of cellular respiration.  Students will understand that the materials used in photosynthesis and cellular respiration create a cycle and that energy flows through that system.  Students will understand how all living organisms are interconnected and that changes in the environment have different effects on each one as individuals and as part of a system. | | | | | |
| **Curriculum-Framing Questions** | | | | | |
|  | | **Essential Question** | | How are we all connected? | |
|  | | **Unit Questions** | | How do organisms collect and use energy?  How do materials cycle in biologic systems? | |
|  | | **Content Questions** | | What is photosynthesis?  What is cellular respiration?  What is an autotroph? Heterotroph?  What is a “greenhouse gas”?  What gases are considered greenhouse gases? | |
| **Assessment Plan** | | | | | |
| **Assessment Timeline** | | | | | |
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| **Assessment Summary** | | | | | |
| Students will be assessed on prior knowledge and assess themselves on a daily basis with the warm-up questions at the beginning of each class. They will self-assess using checklists and rubrics for the two major activities of the unit. They will need to conference with the teacher (as a group) and write an individual reflection paper at the end of the unit. There will be a paper and pencil test to check for content knowledge at the end of the unit. | | | | | |
| **Unit Details** | | | | | |
| **Prerequisite Skills** | | | | | |
| Students will need the knowledge of how energy moves through an ecosystem (covered earlier in the course). Students will need some knowledge of technology to create a newpaper/newsletter. | | | | | |
| **Instructional Procedures** | | | | | |
| Students will begin the unit learning vocabulary needed for the unit and doing some worksheet materials to begin to understand that photosynthesis and cellular respiration form a cycle of materials that transfer energy through ecosystems. Students will then perform an experiment that shows how photosynthesis works (this may be a teacher demonstration with Vernier probes rather than an “experiment”). The students, in pairs, will then design an experiment where they vary one of the components of the demonstration (pH, temperature, light, amount of CO2, etc). Results of this experiment will be shared with the class. Computer lab time would then allow the students to begin to familiarize themselves with the actual buildup of greenhouse gases focusing on CO2. From this information students will create a 2 page newspaper that tells about their understanding of the effect of increased CO2 on plants and algae, a description of the photosynthesis process, a crossword using vocabulary from the unit, some effect of increased CO2 on animals and other heterotrophs, and a description of the cellular respiration process. | | | | | |
| **Accommodations for Differentiated Instruction** | | | | | |
|  | **Special Needs Students** | | Special needs students will have extra time provided in the resource room. Grouping will be done to support their efforts. Some IEP’s will provide for shorter written assignments and/or additional time for completion. | | |
|  | **Nonnative Speakers** | | * Ask the ELL support teacher to help the student develop a glossary of terms in both English and the student’s first language * Allow for visual representations to reduce the language load * Write vocabulary terms on a chart as they are introduced * Allow the student to write material in the student’s first language for later translation | | |
|  | **Gifted/Talented Students** | | GATE students can be allowed to explore a second variable on the experiment and write a report analyzing their separate effects. They would be expected to come up with a hypothesis on the effect of using both variables at the same time. | | |
| **Materials and Resources Required For Unit** | | | | | |
| **Technology – Hardware** (Click boxes of all equipment needed) | | | | | |

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| Camera  Computer(s)  Digital Camera  DVD Player  Internet Connection | Laser Disk  Printer  Projection System  Scanner  Television | VCR  Video Camera  Video Conferencing Equip.  Other |
| **Technology – Software** (Click boxes of all software needed.) | | |
| Database/Spreadsheet  Desktop Publishing  E-mail Software  Encyclopedia on CD-ROM | Image Processing  Internet Web Browser  Multimedia | Web Page Development  Word Processing  Other |

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| **Printed Materials** | Textbooks will be used to gather background information. Printed worksheets to introduce and familiarize students with vocabulary and processes. |
| **Supplies** | Plant material for use in the experiment, pH buffers, various light sources, CO2 cartridges. |
| **Internet Resources** | Int Resc |
| **Other Resources** | untitled2 |

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